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M. THE SPECIES OF AURANTIPORELLUS

Pileus soft, effused, orange-colored, 1-4 cm. thick.

A. alboluteus (E. & E.) Murrill

N. THE SPECIES OF PYCNOPORELLUS

Pileus thin, dimidiate, orange-colored, friable when dry.

P. fibrillosus (Karst.) Murrill

O. THE SPECIES OF PYCNOPORUS

1. Pileus thick, smooth, opaque.

P. cinnabarinus (Jacq.) Karst.

Pileus thin, often zonate, brilliant-red.

P. sanguineus (L.) Murrill

P. THE SPECIES OF AURANTIPORUS

Pileus ochraceous or reddish-orange, tubes orange when fresh, becoming dark and resinous on drying.

A. Pilotae (Schw.) Murrill

Q. THE SPECIES OF LAETIPORUS

Pileus large, yellow throughout, fragile when dry. *L. speciosus* (Batt.) Murrill

NEW YORK BOTANICAL GARDEN.

TERATOLOGICAL NOTES

BY C. STUART GAGER

The following instances of structural abnormalities are not presented as contributions. Most of them have been reported before, and some of them often, either in the species here recorded, or in allied species. In complying with a request from the editor of *TORREYA* for an article on teratological observations, it was thought that those given below would be of popular interest, and it is hoped that the paper may stimulate further observations, especially on the part of amateur botanists.

Polycotyly and Syncotyly in Onagra biennis.—Seedlings of dicotyledonous species having three cotyledons are of frequent occurrence, and in "Die Mutationstheorie," de Vries describes such seedlings for *Oenothera Lamarckiana*, *O. laevifolia*, *O. lata*, and *O. rubrinervis*. In experimental pedigreed cultures he found the anomaly hereditary in less than three per cent. of the offspring of plants that possessed it. Fusion of the two cotyledons into one was figured by de Vries for *O. glauca*, and, in crossing half and middle races ("Die Mutationstheorie" 2: 345), this was

found to be a Mendelian character. I have found an instance of both tricotyly and syncotyly this spring in pedigreed cultures of *O. biennis*.

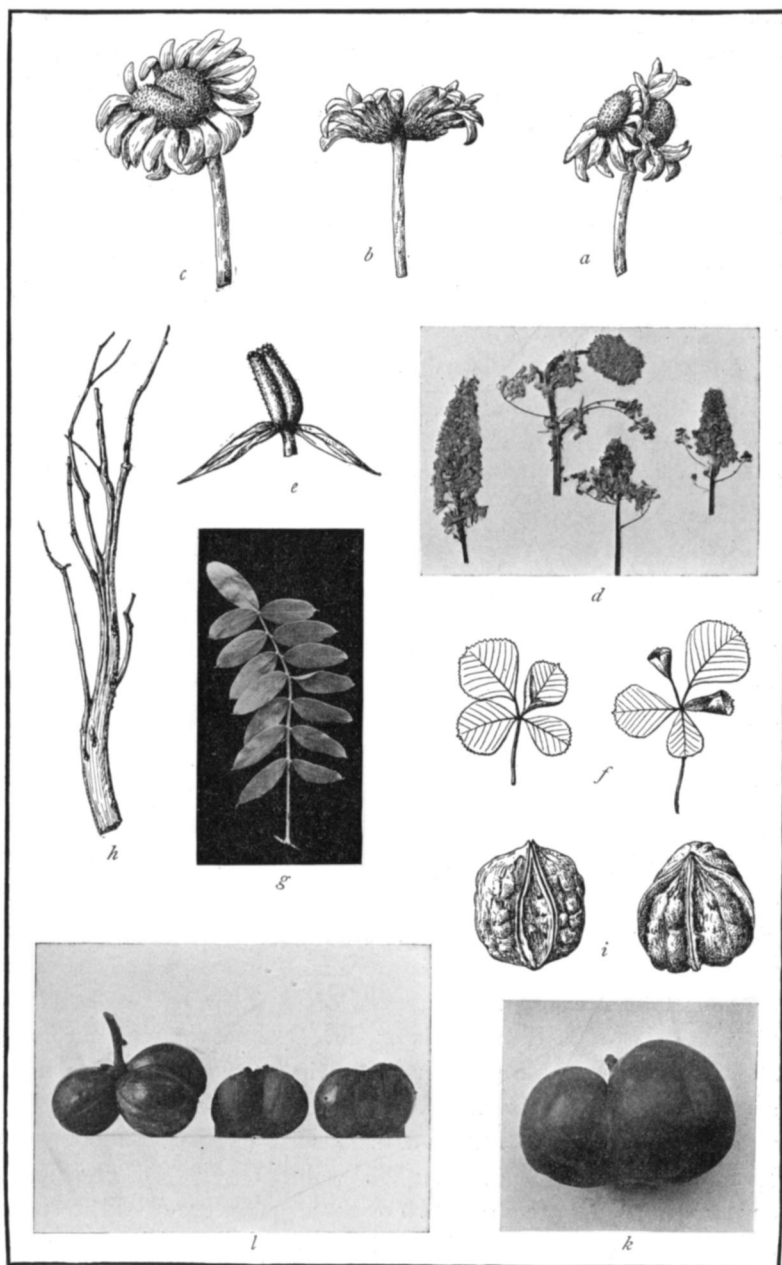
Fusion of Capsules in Onagra biennis.— In “Die Mutations-theorie” de Vries (*l. c.* 2 : 349–350) has called attention to cases of the occurrence of two flowers in the axil of one leaf in *Oenothera Lamarckiana*. Both flowers produced capsules with seeds and de Vries suggests that the anomaly is due to the development of a supernumerary flower in the axil of an undeveloped supernumerary leaf. Among pedigreed cultures of *O. biennis*, I observed one instance, in the fall of 1907, of two capsules, one very slightly above the other, fused or grafted together throughout their entire length. Each capsule was in the axil of a separate bract, as pictured in figure *e*, and both contained maturing seeds.

A Twin Apple.— Twin fruits of the apple, pear, strawberry, plum, cucumber, and many other species are, as is well known, not at all uncommon. Much literature on this point is cited by Moquin-Tandon, Masters, and Penzig. In the *Gardener's Chronicle* for 1855 (p. 692), there is figured a twin apple caused by two flowers being “accidentally brought into close contact in the earliest state of the bud, being kept firmly in contact as they advanced in growth,” and ending “by becoming half incorporated.” In the same magazine, in 1879 (46 : 767), the same sport is again noted, and is said to be not uncommon in the Cluster Golden Pippin, and frequent in the Bedfordshire Twin. Also in the same publication (54 : 564. 1883) is recorded a case of triplet apples, three “fused together into one mass at the base.” Sometimes there are two peduncles, one for each half of the twin, and an instance has been recorded in which one of the peduncles has become broken off from the branch, so that the nourishment of the fruit attached to it had to be derived entirely from the apple with which it was fused. Masters (*Vegetable Teratology*, p. 20) figures an example of the adhesion of two apples, and, on page 327, a case of interrupted growth, where the peduncle above the normally formed fruit has filled out, and formed a much smaller fruit above the first. In the specimen illustrated in the accompanying figure, and probably a variety of the russet, the peduncle

bears a fringed ridge lengthwise along one side, indicating that it was formed by the fusion of two adjacent peduncles. The specimen shown in figure *k* was presented to the writer by Professor Underwood in the autumn of 1907.

Twin and Triplet Hickory Nuts. — Monstrosities in the hickory are relatively rare. An embryo of *Hicoria ovata* (*Carya alba* Nutt.) with three cotyledons has been described by Dr. N. L. Britton (Bull. Torrey Club 7: 21. Feb. 1880) and by H. C. B[eardsley] (*ibid.* 7: 54. May 1880). Dr. Britton has also described a tree of *Hicoria glabra* (*Carya porcina* Nutt.) where most of the leaves, normally pinnately compound, were simple (*ibid.* 8: 132. 1881). Dr. Arthur Hollick exhibited before the Torrey Club in 1881 (*ibid.* 8: 60) a distorted fruit of *Hicoria glabra* (*Carya porcina*) which he described as occurring year after year near Court House Station, on the Staten Island Railroad. Only two or three other monstrosities are noted in this genus by Penzig. In 1886 Dr. Hollick (Proc. Nat. Sci. Assoc., Staten Island 1: 35) exhibited and described twins and triplets of *Hicoria alba* (*Carya tomentosa*). "The twins," he says, "were generally perfectly joined, but the triplets were separate, with the sides flattened where they pressed against each other, similar to chestnuts in a bur. All the nuts from the same tree were more or less affected." Such a variation as this is well shown in figure *l*, and I think no illustration of it has been published before. The specimens (*Hicoria alba*) were collected by Mr. Percy Wilson in 1901, near the N. Y., N. H. & H. R. R. station at Baychester, New York. Dr. Hollick's description is sufficient for these specimens.

Ascidia in Clover. — The formation of pitchers in clover is so common that the instance here figured (fig. *f.*) is referred to primarily because it was stated by the pupil who collected the specimens that every leaf of the plant which bore them possessed ascidia. I did not have the opportunity to observe the plant personally. In "Die Mutationstheorie" (1: 641), it is stated that *Trifolium repens* in the garden forms ascidia only in spring, the pitchers preponderating on the first leaves of the shoot. Mulder (Tidjschr. Natuur.-Gesch. en Physiol. 6: 109. 1839) describes and fig-



ures (Pl. V, f. 1) leaves of *Trifolium repens*, in one of which the middle leaflet is small and dwarfed ; in a second this leaflet is modified as an awn ; while in a third it appears as a stalked ascidium, very similar to the one here figured. Two other points are of interest in connection with the instance here figured. First, the character of the almost sessile pitcher in the leaf that has two, where the margins adhere only at their distal portions. Second, the fact that the ascidia are supernumerary leaflets. If they were removed the leaf would still possess the number of parts normal for the species (*T. repens*?).

Ascidia in Licorice. — So far as I have been able to find, pitcher-formation has not been previously recorded for the licorice (*Glycyrrhiza glabra*). By inspection of figure *g* it is seen that one leaflet of the fourth pair from the base is a shallow ascidium.

Fasciation in the Honey-locust. — In his "Éléments de Tératologie Végétale" (Paris, 1841, p. 149) Moquin-Tandon, speaking of fasciation in woody dicotyledons, includes the *fevier*, or *Gleditschia* in his list. According to Penzig (Pflanzen-Teratologie, p. 407), Camus recorded fasciation in the variety *inermis* (Anomalie e varietà nella Flora del Modenese. Terza contribuzione Rendiconti della Soc. dei Naturalisti dei Modena. Ser. III, 3. 1886). I have never seen this fasciation figured before. The specimen shown in figure *h* was brought to me by Miss Jean Broadhurst.

Tricarpellate English Walnuts. — Multiplication of the number of parts in the flower is of very common occurrence. Moquin-Tandon (*l. c.*, p. 354), however, called attention to the fact that polyphyly of the gynoecium is more rare than suppression of the organs, on account of the pressure of adjacent parts. Masters (*l. c.*, p. 363) adds that the later development of the carpels is also a factor here. He gives a list of eighty-nine genera in which supernumerary carpels have been observed, and states that the phenomenon is most common in Cruciferae, Umbelliferae, and Liliaceae. Among some English walnuts (*Juglans regia*) recently purchased at a store, two or three nuts were found to have three carpels (see figure *l*) instead of the usual two. While such a thing is common in plants, *Juglans regia* is not included in the

list given by Masters, and I have not seen such a case reported for that species.

A Two-headed Daisy. — The doubling, and even the tripling of the heads in the ox-eyed daisy (*Chrysanthemum Leucanthemum*) and in the dandelion (*Taraxicum Taraxicum*), and other Compositae and Chicoraceae has been often recorded. It is thought, however, that the instances here figured will be of sufficient "popular" interest to justify their mention in TORREYA. The specimens were sent me by Professor Margaret C. Ferguson, of Wellesley, and clearly show three types of the double head. In figure *a* the two heads are quite distinct on the common stalk, directly opposite each other, and forced by their mutual crowding to grow with the discs nearly vertical, instead of horizontal as normally. In *b*, the two heads are more closely united, while in *c* the fusion is complete, giving the appearance of an elongate and abnormally large inflorescence. The groove in the center of the disc is characteristic of such sports. In each case the peduncle was fasciated throughout its entire length. These double heads are not uncommon in the *Rudbeckia*, or yellow daisy.

Fasciation in Delphinium. — Abnormalities in the inflorescence of the lark-spur are of several varieties, and much of the literature is cited by Penzig. One of the earlier references to the subject is that of Fermond who, in his "Essai de Phytomorphie" (2: 321. Paris, 1864), described a variation in the inflorescence of *D. ajacis* analogous to "cyclochorize pollaplasique." The accompanying illustration, figure *d*, shows four flower-clusters collected in the New York Botanical Garden in the summer of 1907. At the left is a normal inflorescence, in striking contrast to which are the three fasciations at the right. All of the individual flowers appeared to be normal.

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